

IN THE CLAIMS:

Please amend claims as follows.

1. (currently amended) A tuneable phase shifter and/or attenuator comprising a waveguide having a channel defined by internal walls of the waveguide and a piece of photo-responsive material (18) disposed within the waveguide and having an outside surface directly along ~~[[an]]~~ one of the internal walls of said channel, a light source disposed outside the waveguide to emit light through an aperture (30) of said internal wall to impinge on at least part of ~~[[an]]~~ the outside surface of said piece of photo-responsive material (18).

2. (currently amended) The tuneable phase shifter and/or attenuator as in claim 1, wherein the photo-responsive material (18) is a photo-conductive material, e.g. ~~Si, GaAs or Ge~~.

3. (currently amended) The tuneable phase shifter and/or attenuator as in claim 1 wherein at least the surface of the piece of photo-responsive material facing the aperture is pacified by oxidation.

4. (original) The tuneable phase shifter and/or attenuator as in claim 3, wherein at least the surface of the piece of photo-responsive material facing the aperture has a coating of an epoxy resin.

5. (currently amended) The tuneable phase shifter and/or attenuator as in claim 1, wherein at least part of the surface of the piece of photo-responsive material facing the aperture is covered with strips of reflective elements to avoid radiation inside the wavelength to be lost outside.

6. (original) The tuneable phase shifter and/or attenuator as in claim 5, wherein said strips form a grid.

7. (currently amended) A tuneable phase shifter and/or attenuator comprising a waveguide having a channel defined by internal walls of the waveguide

and a piece of photo-responsive material disposed within the waveguide ~~and spaced from an internal wall of said channel~~, and a light source to emit light to impinge on at least part of a surface of said piece of photo-responsive material, characterized in that the photo-responsive material is spaced from an internal wall of said channel and in that the light source [[being]] is adjustable to generate in the piece of photo-responsive material a carrier concentration between 10^{12} cm^{-3} and 10^{16} cm^{-3} , to modify the real and imaginary part of the dielectric constant of the photo-responsive material whereby at least one mode is generated that has part of [[its]] a field of said mode inside the piece of photo-responsive material and another part of [[its]] the field in the waveguide whereby a phase shifter and/or attenuator that is dependant on the light illumination is generated over a frequency range.

8. (original) A tuneable phase shifter and/or attenuator as in claim 7, wherein said carrier concentration is between 10^{14} cm^{-3} and 10^{16} cm^{-3} .

9. (currently amended) A tuneable phase shifter and/or attenuator as in claim 7, wherein [[a]] said mode is of a first type that has a field intensity inside the photo-responsive material layer that is small relative to the field in the channel outside the photo-responsive material.

10. (original) A tuneable phase shifter and/or attenuator as in claim 9, wherein said mode of a first type is TE_{20} .

11. (currently amended) A tuneable phase shifter and/or attenuator as in claim 7, wherein [[a]] said mode is of a second type that has a field intensity inside the photo-responsive material that is high relative to the field in the channel outside the photo-responsive material.

12. (currently amended) A tuneable phase shifter and/or attenuator as in claim [[7]] 11 wherein [[a]] said mode of the second type is TE_{10} or TE_{11} .

13. (currently amended) A tuneable phase shifter and/or attenuator as in claim 12, wherein the intensity of the light source is adjustable to place at least one of said modes of the second type in a cut-off state.

14. (previously presented) A tuneable phase shifter and/or attenuator as in claim 1, wherein the illumination of the piece of photo-responsive material is carried out at an angle such that total internal reflection occurs.

15. (new) The tuneable phase shifter and/or attenuator of claim 2, wherein photo-conductive material is one of Si, GaAs or Ge.

16. (new) The tuneable phase shifter and/or attenuator of claim of claim 1, wherein the light source is adjustable to generate in said piece of photo-responsive material (18) a carrier concentration between 10^{18} cm^{-3} and 10^{21} cm^{-3} .